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**ASSEMBLIES and CORRIDORS**

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## Assemblies and Corridors

You must have a valid profile with finished ground drawn in the profile (Profile > Create Profile from Layout) to complete this step.

In older versions of Land Desktop, you'd have the opportunity to create channel templates to apply to the profile. Civil 3D breaks this into "Subassemblies" which combine to make an "Assembly" with which, you build "Corridors". There are no usable pre-made channel "assemblies" at this time. You'll have to create what you want. The process is relatively easy, but depending on how you build it...you may have to lie to the program to do it since it sometimes thinks your building a concrete road with a thick subbase.

An **Assembly** defines the attachment point of your cross-section to the alignment. The attachment point occurs at the midpoint of the assembly marker.

A **Subassembly** represents individual components of the proposed cross-section. Subassemblies attach to the left or right side of an assembly's attachment point.

A **Corridor** is a 3D model of a proposed design based on alignments, profiles, and assemblies. Corridors can be used to create finished ground models or generate section data. Corridors can be used to represent an individual alignment, profile and assembly, or multiples of each.

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For this example our alignment represents the Center Line of a 10' bottom width waterway. Therefore, when we build our subassemblies they will be set an equal distance (5' each) from the assembly marker. Be aware, that if your alignment represents the left or right side of your object (waterway, diversion, etc), you would want to build the subassemblies appropriately.

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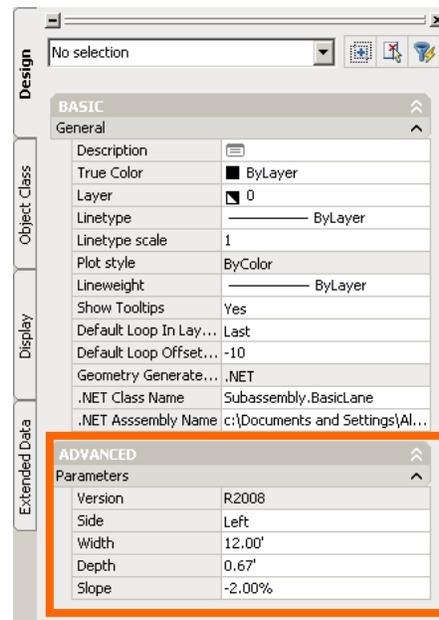
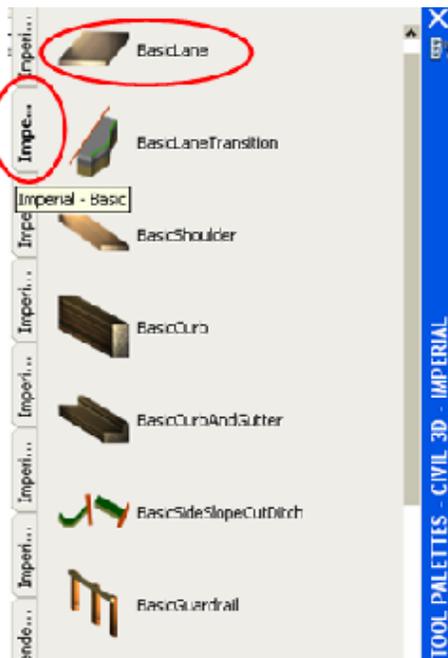
### Creating a Channel Template From Scratch:

- In the menu "Corridors", pick "Create Assembly".
- You'll get a dialog box titled "Create Assembly".
- Give your Assembly a name like "10'WW".
- Pick "OK".
  
- The "Command" Line prompts the question: Assembly baseline location?
  - *You need to pick a spot on the screen to place it.*
  - You get a vertical line with a circle or triangle at the midpoint. This is the frame that defines your assembly. All your "subassemblies" must attach to this.

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**\*\*\*Note:** When working with Subassemblies I highly recommend ONLY changing the Left and Right Parameters before attaching the subassembly to the marker. After attaching, go back into the Properties to change the other parameters.

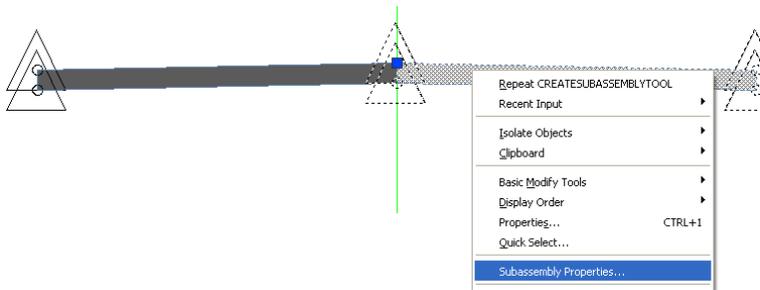
- In the menu “Corridors”, pick “Subassembly Tool Palettes”.
- You’ll see an extensive dialog box organized with tabs.
- Look for the tab marked “Imperial Basic” We’ll use this to create the bottom of the channel.
- You can use many different subassemblies to create the bottom of the channel including BasicLane, BasicLaneTransition, Link Width and Slope, etc. Pick one of them. For this example we will use “Basic Lane”.



- The Properties dialog box appears with 2 main divisions: Go to “Advanced”, Parameters:
- You see the column marked “Side”. Left and Right designate which side of the centerline (Assembly Baseline) you’ll be building.

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- You'll notice on the main screen you have a "Pick" box. Pick the little circle or triangle at the midpoint of your "Assembly Baseline".
  - Depending on whether you had Left or Right chosen, half the bottom of your waterway will attach itself to your baseline assembly.
- Switch the Left/Right setting in the dialog box and pick the midpoint again to get the other half of your channel bottom.
- To change the rest of the Subassembly properties click on either the left or right subassembly so it is highlighted, right click, and select "Subassembly Properties"

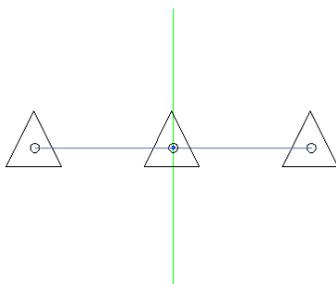
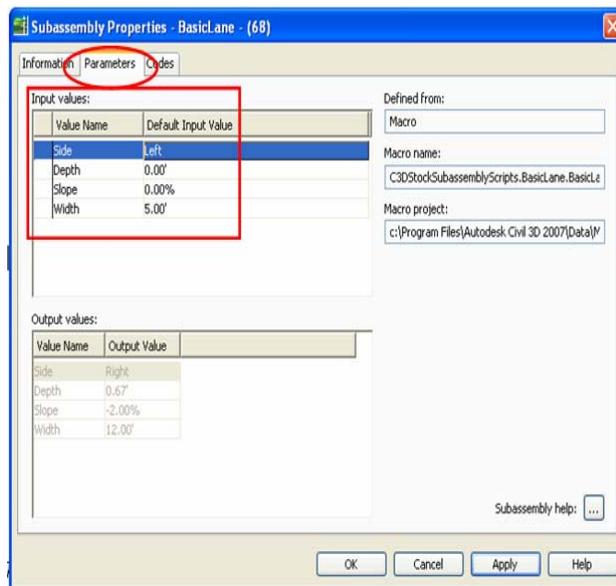


Go to the "Parameters" Tab and change the following:

• **"Depth"**, below that, would be the thickness of your concrete lane. Under "Depth", type in a really small number like 0.0001. *The program will round the number off to 0.0'.*

• Below that **"Slope"** indicates the degree of crown on the roadway. Type in 0.

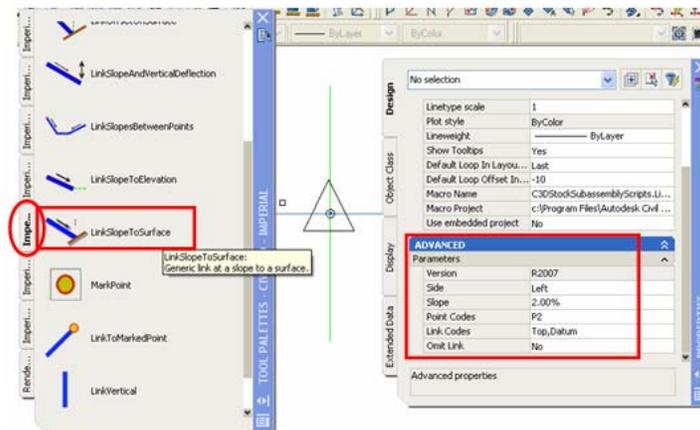
• **"Width"**. This is width left and right of center. A 10 foot width bottom would have a Default Width of 5 ft. each side of the centerline. Change the default width to 5'.



- You will notice the difference in your subassembly.
- Exit out of the properties box, and change the setting on the other subassembly.

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- Now, from Subassembly Tool Palettes, pick the tab marked “Imperial Generic”.
- A little past half way to the bottom, you’ll pick the “LinkSlopeToSurface” subassembly.
- You’ll see the same type of dialog box with “Basic”, and “Advanced”.
  - Go to “Advanced”, Parameters: *This is basically the same process, only this time you are creating the left and right sideslopes of your channel.*
  - In this process you need change only the Left/Right setting
  - The program will automatically convert your sideslopes to a percent. (you can type in 8:1 and the program will convert it to 12.5% slope)



### IMPORTANT NOTE: Reusing Assemblies in other Drawings

Any time you create a channel template you can save it as a Block to be used in later projects.

- Type “WBLOCK”, pick the channel assembly and save it with your other block drawings.
- Use “DDINSERT” to pull into any future drawing.
- Once you pull it into another drawing you can Explode the block, and you will be left with the original assembly and subassembly properties, which you can modify by going into the Properties.

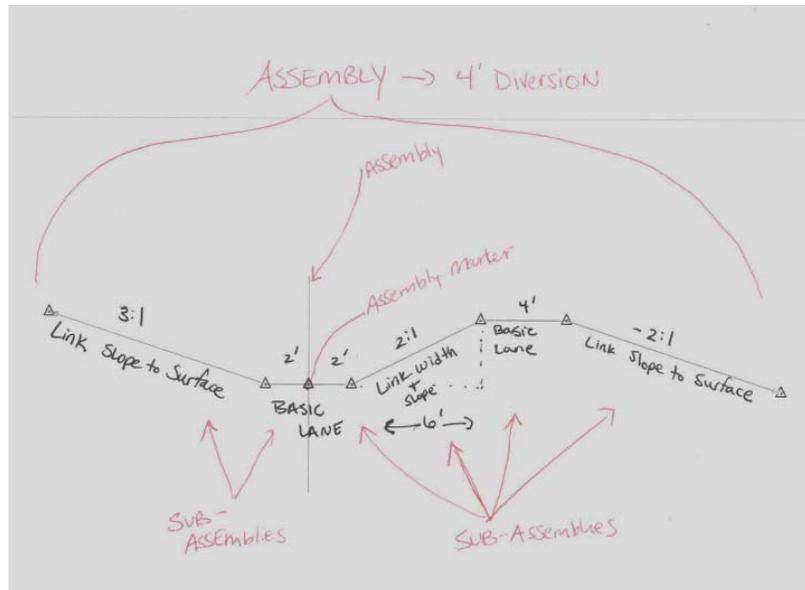
You can also open up a drawing that has an assembly, copy the assembly, and paste it into the drawing you are working in.

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### Final Assembly Notes:

Assemblies can be more complex, such as a diversion. (See the example below) For help on choosing the proper subassembly, see the AutoCAD Civil 3D Help, as it contains extensive documentation for each subassembly.



### Creating a Corridor:

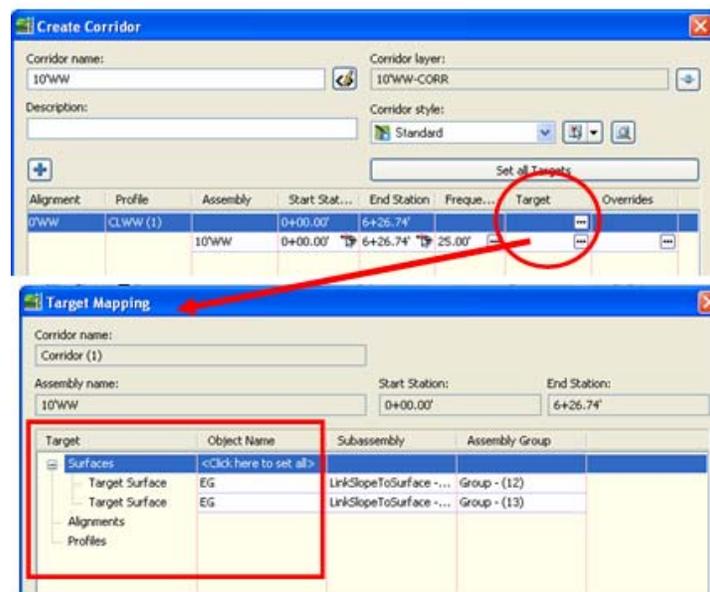
- In the menu “Corridors”, pick “Create Corridor”.
- When the “Command” line asks you to “Select a baseline alignment”
  - Right-click to get a list of your defined alignments.
  - Pick the appropriate one.
- The “Command” line asks you to “Select a profile”
  - Right-click to get a list of the profiles you created.
  - Pick the one you assigned designated to be “Finished Ground” for your planned waterway bottom.
- The “Command” line asks you to “Select an assembly”
  - Right-click to get a list of the assemblies you created.
  - Pick your choice (10' ww).
- You get a large dialog box, labeled “Create Corridor”.
- Choose a corridor name consistent with the rest of your process, (i. e. 10' WW Corridor).
- You will see several columns in this dialog box. You can edit all of them to get your channel to do what you want:
  - You can change the beginning and ending station of the work.
  - You can set the frequency of sampling, (25' is default).

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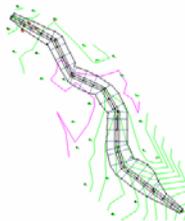
Target Mapping allows you to assign a surface to which daylight subassemblies are day lighted.

**!!! YOU MUST SET THE “TARGET” COLUMN OR DAYLIGHTING WILL NOT OCCUR. You only want to set the target for the Surface, if other options are available (such as Alignment or Profile) do NOT set those targets as we only want to daylight to the EG Surface!**

- In the “Target” column’, pick the little box with the 3 dots.
  - You’ll get another dialog box marked “Target Mapping”.
  - You’ll see 3 categories of targets. The first category is “Surfaces”.
  - Pick the row marked “Object Name”.
  - Pick your existing ground (EG) surface as your target surface. This will daylight your sideslopes properly.
  - Hit “OK”. The Target Mapping box will close out.



- Hit “OK” again to close out the “Corridor” dialog box.
- Things will flash, and data will appear, and the “Event Viewer” may pop up, showing a lot of events. Close it out if it pops up.
- If you look on your plan view, you now have the outline of a waterway with daylight lines.

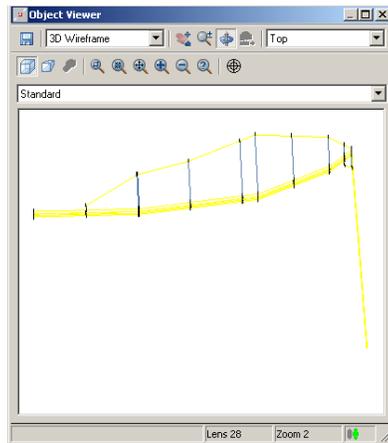


**ASSEMBLIES and CORRIDORS**

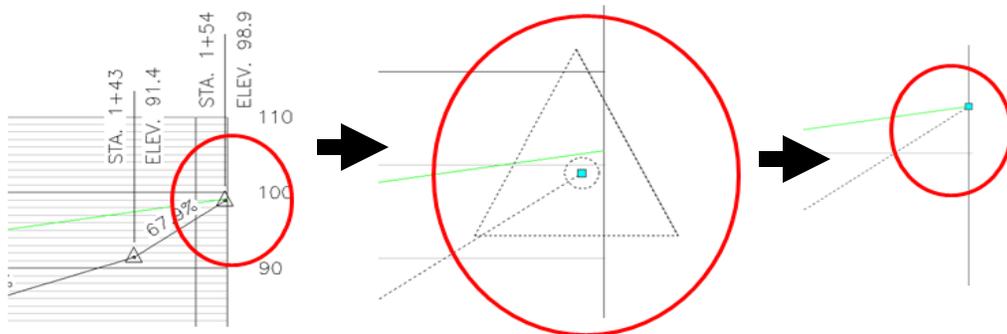
**Common “Drop Off” Problems:**

Check out your corridor in 3D by highlighting the corridor > right clicking > object viewer

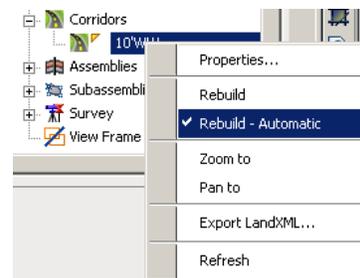
Does your corridor drop off anywhere? This tends to be a common problem that can easily be fixed!



**Make sure the start and ends of your Finished Ground on your Profile is O-Snapped to the existing ground.**



**You may need to rebuild your corridor (in prospector) after you do this.**



**If that doesn't do the trick you'll have to create a boundary around the corridor.**

You'll need a Corridor Surface to do this (a surface created from a corridor).

See page 10 for instructions on how to add the boundary to your corridor surface!

## ASSEMBLIES and CORRIDORS

### Complex Corridors:

Each Corridor can have multiple alignments, profiles, or assemblies. To adjust corridors, after they are created, you must go to the Corridor Properties dialog box. (Right click on the corridor in model space, chose “Corridor Properties”).

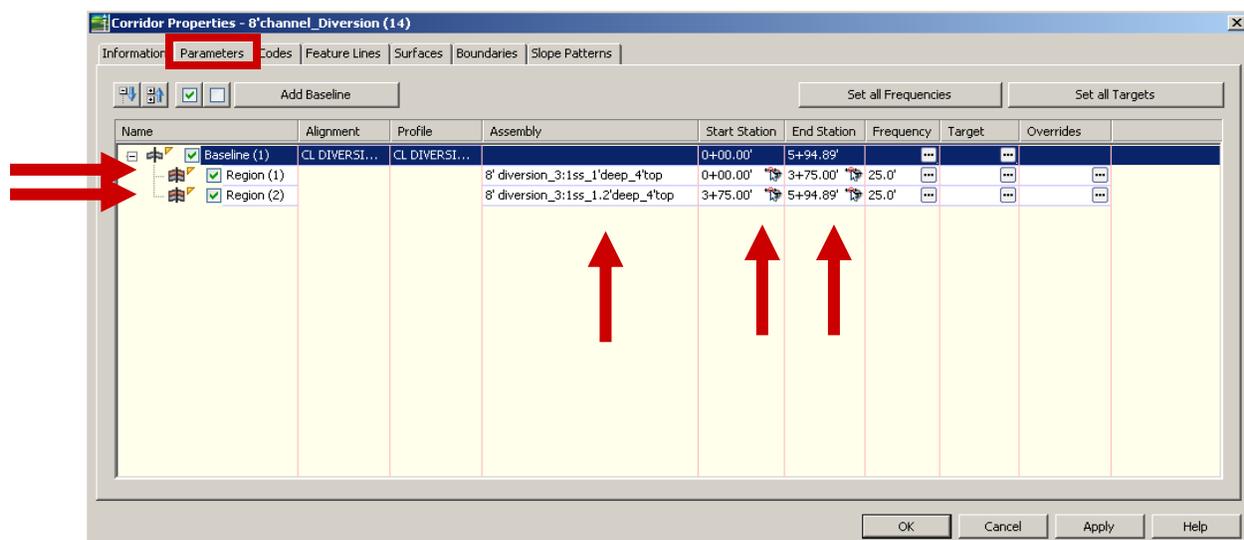
#### Parameters Tab

In the Parameters tab you can review and adjust most of the corridor controls, including which alignment, profiles, and assemblies are being used.

Baseline is the attachment point of the assembly (most like the centerline of your object such as the centerline of the 10’ waterway).

Each baseline has at least 1 Region. Each region is an area which a particular assembly applies. You can have multiple baselines and multiple regions within the same baseline.

Each region has controls that enable you to review the Target Mapping as well as the Frequency at which corridor sections should be created.



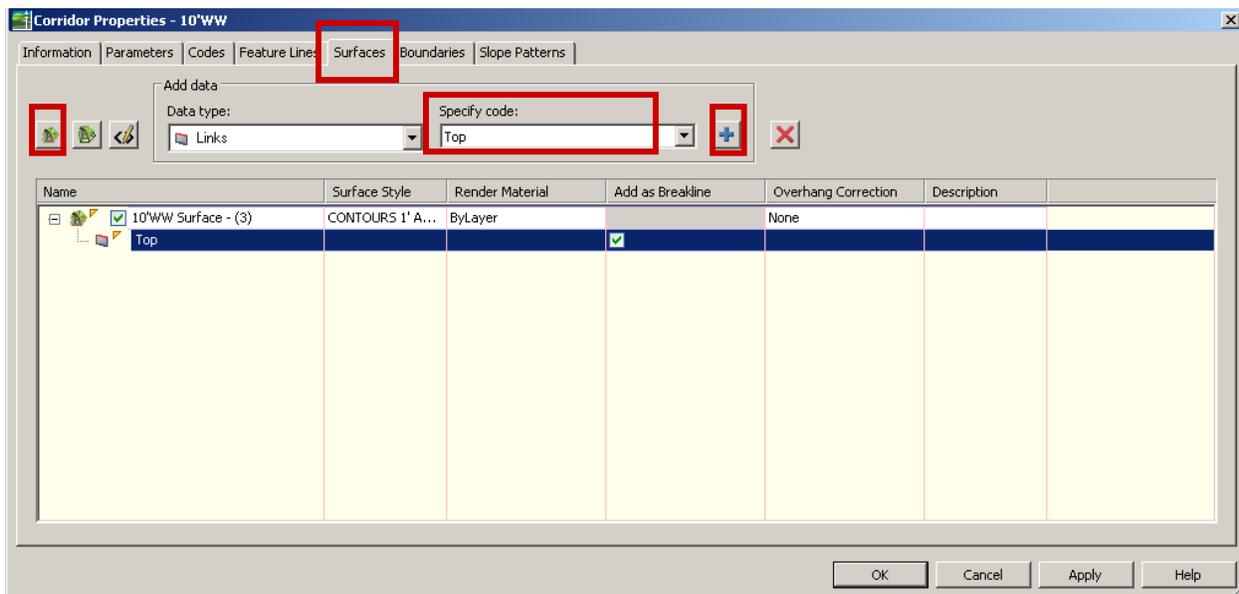
### Corridor Section Review and Edit

Complex corridors can be greatly simplified through the **Corridors > View/Edit Corridor Section**. This will launch the View/Edit Corridor Section Toolbar, which allows you to review and edit sections interactively. The editor allows access to review and change most subassembly parameters. The editor allows you to modify those sections that need section attention, such as different daylight slopes. It also allows you to add and remove some subassemblies or links directly from a section. These parameter changes, additions, and deletions can be done for a single section or a range of sections.

**ASSEMBLIES and CORRIDORS****Creating a Surface from a Corridor:**

The Surfaces tab of the Corridor Properties dialog box enables you to build the proposed surface based on corridor geometry. As the corridor changes, its surfaces automatically update.

- Right click on the corridor in model space, choose “Corridor Properties”
  - Choose the “Surfaces” Tab
  - Click on the “Create a Corridor Surface” icon
  - Make sure under “Add Data” the Data Type is “Links” and Specify Code is “Top” (top surfaces follow the uppermost part of the corridor geometry). Click the blue + sign.
  - You can choose to check the “Add as Breakline” box.
  - Click “OK”
- Your surface should now appear. The surface will be on the layer that was current at the time you created the corridor surface.



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### ADDING BOUNDARIES

#### Why Add Boundaries?

- 1) To control where your corridor surface is located, i.e. keeping the contours in the corridor surface area.
- 2) Keep surfaces from dropping off to elevation 0.

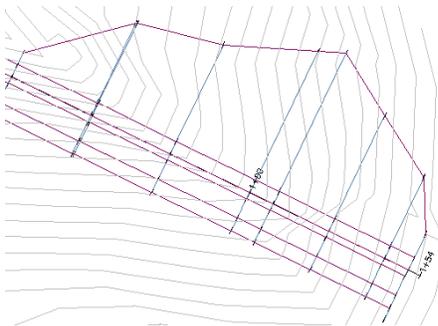
**Method 1:** Add the boundary through Prospector (just like you do for any surface, therefore I'm not going to go into detail on this method).

- 1) Draw a polyline that represents the boundary around your corridor.
- 2) In Prospector, under the name of your Corridor Surface, right click on boundaries and click "ADD". Chose the type of boundary (typically outer ) click "OK". Click on your boundary line you drew. Wahla.. Your data is added!

**Method 2:** Add the boundary through the Corridor Properties dialog box.

- 1) To open the Corridor Properties dialog box, right click on the name of your Corridor in Prospector and choose "Properties"
- 2) In the Boundaries Tab > right click on the name of your corridor surface
  - If you already drew a polygon around the boundary of your corridor surface you can choose the "**Add from Polygon**" and follow the command line
  - If you need to draw in the Polygon choose "**Add Interactively**" and follow the command line.
  - You'll need to have your Corridor Feature Lines shown (the lines that show the skeleton of your corridor... *The purple lines in the figure below*).
  - In some places when you select a point you may be asked to select a feature line, choose the appropriate response based on the *table below*.

For codes not listed here look them up in the online Help system's Subassembly Reference document. (Right-click on the Subassembly icon in a tool palette and choose Help.) In the Help system, look for a coding diagram located at the bottom of the menu.



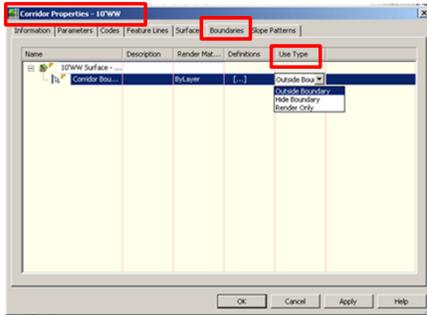
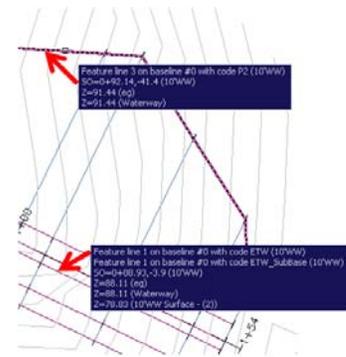
Crown	Crown of road on finish grade
ETW	Edge-of-traveled-way on finish grade
Crown_Subbase	Crown of road on subbase
ETW_Subbase	Edge-of-traveled-way on subbase
Top, Pave	Paved finish grade
Datum, Subbase	Subbase

**ASSEMBLIES and CORRIDORS**

**BOUNDARIES (continued)**

**FYI**

Also, when your not in a command, you can hover over any corridor feature line and it will tell you all the codes that are available. For instance the top feature line code is P2. The bottom feature line is coded ETW and ETW\_Subbase.

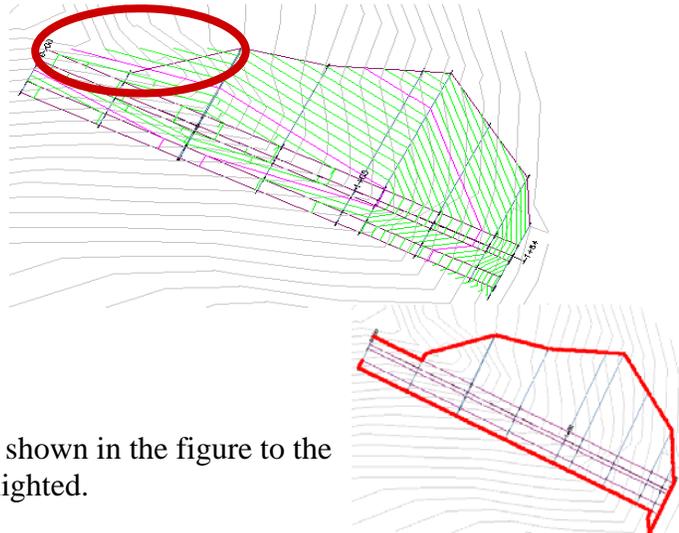
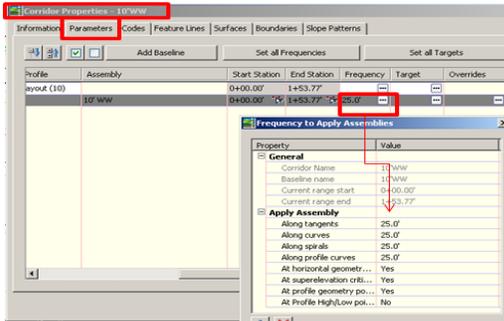


Once you have created your boundary. Make sure the proper Use Type is selected in the Corridor Properties dialog box (most often would be outside boundary.)

Click "OK" and your boundary should be added!

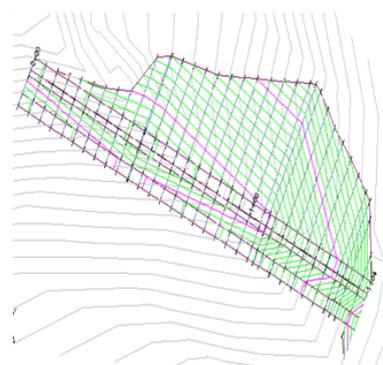
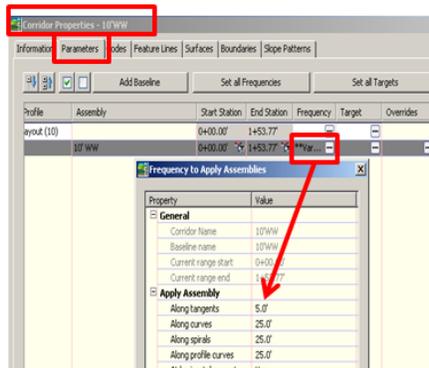
**Importance of Frequency**

Sometimes corridors will not daylight (although it will triangulate) if the frequency is set high, in this case 25' (see below right figure).



An interactive traced boundary like the one shown in the figure to the right will not include areas that are not daylighted.

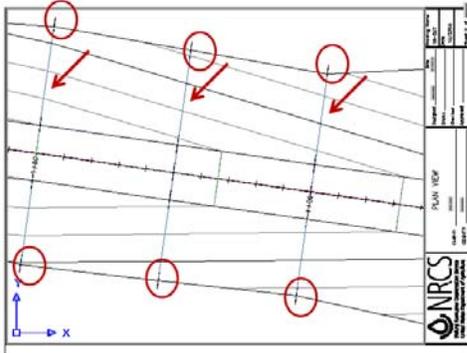
By decreasing the frequency (say to 5') the corridor will become more precise in its daylighting and contouring.



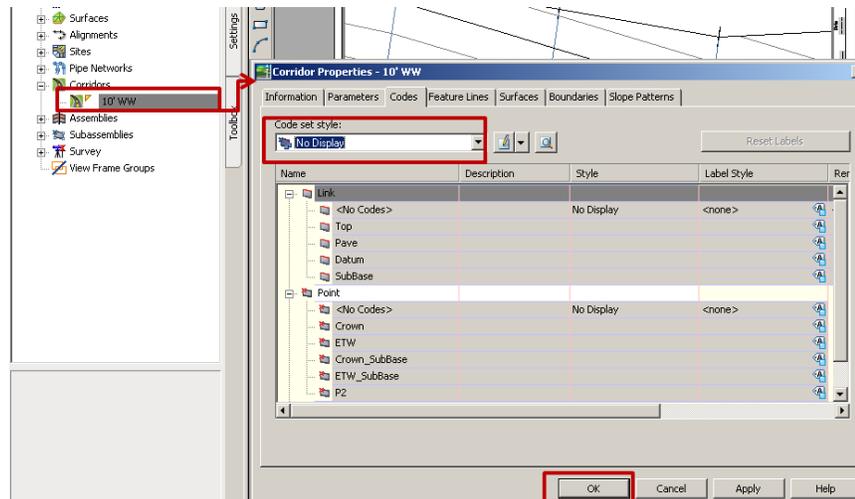
## ASSEMBLIES and CORRIDORS

### PRINTING YOUR CORRIDOR SURFACE

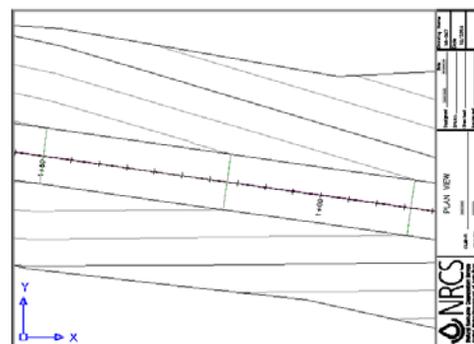
The default settings for your corridor have many extra lines that you will not want to show when you print your corridor. You'll want to "no display" these lines to have a clean corridor for printing.



In Prospector, right click on the name of your Corridor. The Corridor Properties dialog box will open. In the "Codes" tab, change the Code Set Style to "No Display." Hit "OK" at the bottom of the dialog box.



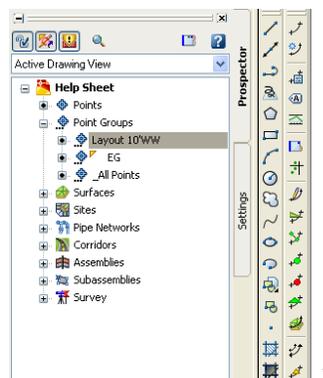
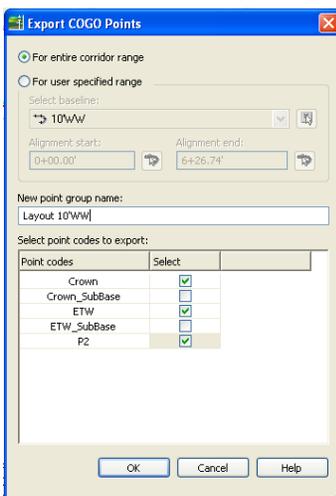
You should now be ready to print your corridor!



## ASSEMBLIES and CORRIDORS

### Creating Layout Points from a Corridor:

- In the menu “Corridors”, pick “Utilities”, “COGO Points From Corridor”
  - You will be prompted, at the Command Line, to select a Corridor.
  - Right Click and select from the list.
  
- You’ll get a dialog box labeled. “Export COGO points”
- You can associate layout points to the whole profile, or a “reach” of your choosing.
  
- You’ll need to name the point group that the points will be placed in. (i.e. WW Stakeout Points).
  
- The last thing is to limit the point codes.
  - \*\*\* **Note:** If you are intending to use the points for staking out the channel, you only need the “Crown, (CL). If you intend to use the points to create a surface, you might want to use all 3 descriptions.
  
- “Uncheck” any point codes you do not want. You do not want any subgrade points to describe your channel.
  
- Hit “OK”
  
- You now have all the layout points you’ll ever need to lay out or stake the channel.



The next help sheet in this series is “Cross Sections,” referred as “Sections” in *Civil 3D*. Sections are extremely useful for looking at a slice of any surface but can also be used to display corridor assemblies and calculating volumes.